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Research Program on the  
Management of Science and Technology

INDIVIDUAL AND GROUP DECISIONS  
INVOLVING RISK

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Executives typically make decisions after consultation with colleagues and advisers, either individually or as a group. The effects of such consultation are ordinarily considered to be specific to the subject of the decision. But recent research indicates that there are some general and consistent effects on the riskiness of the decision. Contrary to common belief, committee decisions tend to be more risky than individual decisions.

In 1962 I published in this journal the first report of the surprising finding that groups reach joint decisions which are more risky than the average of the members' individual decisions prior to group discussion. The research was a replication and extension of the basic finding by Stoner (1961) in his Master's thesis. A review of the field by Kogan and Wallach (1967) lists 40 published research reports which stem from the original finding. On the basis of five studies carried out at the Sloan School as thesis projects, and with a valuable assist from Bateson (1966), it is now possible to present a resolution of most of the questions raised by the unexpected finding.

The original research and most of the subsequent studies have made use of a set of 12 short case problems of which the following is a typical example.

Mr. D, an electrical engineer, married with one child, has been working for a large electronics corporation since graduating from college five years ago. Although he is assured of a life-time job with a modest but adequate salary and liberal pension it is very unlikely that his salary will increase much. Mr. D. is offered a job with a small newly founded company with a highly uncertain future. The new job would pay more and would offer the possibility of a share in the ownership if the company survived competition from larger firms.



Imagine that you are advising Mr. D. Listed below are several probabilities (from 0.1 to 1.0) that the new company will prove financially sound. PLEASE CHECK THE LOWEST PROBABILITY THAT YOU WOULD CONSIDER ACCEPTABLE TO MAKE IT WORTHWHILE FOR MR. D TO TAKE THE NEW JOB.

Since 1962, replications, extensions and modifications of the original study have demonstrated the generality of the shift in the direction of greater risk after group discussion. For example, in the problem above, the average individual selected a probability value of about 0.5 while the average group decided on a value of 0.3. The shift has been found with males and females, college students and senior executives, Americans, Englishmen and Israelis. It appears with case problems like the one above which involve advice to a hypothetical person, and with problems where money is personally risked or where the stake involves an unpleasant experience. It has been demonstrated by investigations using group discussion without a group decision, or using written communication of individual decisions to the others, or merely exposing persons to a taped group discussion.

Several explanations for the risky shift have been proposed. An obvious hypothesis is that persons are free to take a more risky position when responsibility for the choice is diffused to the whole group. This hypothesis was first rejected on the basis of a study in which one individual was designated chairman and charged with the entire responsibility for the decision. After he had discussed the problem with his group, which did not try to reach consensus, his choice showed a risky shift equal to that observed in group decisions (Marquis, 1962).



Another hypothesis is that individuals who take a risky position initially will be most persuasive in influencing group opinion. No evidence in support of this explanation has been found (Wallach, Kogan and Burt, 1968).

On the basis of preliminary evidence, Brown (1965) hypothesized that group discussion would correct the impression held by most persons that they are more risky than others. Hinds (1962) had previously demonstrated that individuals do indeed consider that "200 others like you" would take a less risky position. In group discussion such individuals would learn that it is not true, and could shift in the risky direction to maintain their position relative to others.

The above hypotheses were formulated and tested on the assumption that groups are always more risky than individuals. But this has now been shown to be false. Nordhøy (1962) first demonstrated the existence of a shift in the opposite, or cautious, direction after group discussion for some questions. Following is an example of a case problem on which a consistently cautious shift occurs:

A man is about to board a plane for an overseas trip to which he has been looking forward for some time. He awoke that morning with severe abdominal pains about which he is troubled but thinks may be due to nervousness since he has never flown before. He is not far from a hospital, but if he goes there he will miss his plane and this will seriously disrupt his vacation plans. The pain has gotten more severe in the last few minutes.

With respect to cautious shifts, Nordhøy hypothesized that "In the group, the impact of values which are commonly accepted in the culture to which the subjects belong will be reinforced (p. 19) .... on questions where the cultural values support cautious talk or action, individual decisions made after group discussions will be more cautious than individual decisions made without any discussion"(1962, p. 21).



Significant shifts in the cautious direction following group participation have been found in other situations. Zajonc, Wolosin, Wolosin and Sherman (1968) found in their experimental situation that groups showed consistent and significant shifts in the cautious direction.

Stoner (1968) modified the original case problem questionnaire to include six cautious questions and six of the original risky questions. He asked each subject to estimate what choice 200 other people like him would make for each situation. He also asked them to rank 18 social values "in the order in which they are important to you". The phrases were formulated to represent the values involved in the 12 case problems.

The results of this experiment support a relative value hypothesis, which had been proposed in various forms by Stoner (1961), Brown (1965) and others. Those problems which elicited a risky shift were the ones for which people in general had ranked the social value of the outcome prize higher than that of the stake, and conversely for the six cautious questions. Those problems which elicited risky shifts were also the same ones for which people considered others to be less risky. Those problems for which people considered others to be more risky were the ones which elicited cautious shifts.

Theory took a different direction when Burns (1967) developed a hypothesis "that groups are more decisive (extreme) than individuals". This idea is in agreement with Teger and Pruitt's demonstration (1967) of a correlation between average initial risk level and amount of shift. Burns's model predicts shifts in riskiness using only the distribution of the individuals' initial preferences as data. It is therefore applicable to a specific group considering a specific decision. The hypotheses state: (1) individuals with more extreme initial positions are more confident in their decisions, and will influence the group in that direction, (2) the variance of initial positions will stimulate discussion in



the group and result in a greater shift, and (3) the product of the initial extremity and variance determines the amount and direction of group shift. The model can be expressed mathematically as follows:

$$\hat{g} = k_1 EV + k_2$$

in which  $\hat{g}$  is the group decision shift,  $k_1$  the "responsiveness of the group to its shift potential,"  $E$  the initial extremity (discrepancy between average initial position and a neutral mid-position,  $V$  the initial variance and  $k_2$  a constant measuring a general risk bias. The model was tested on 361 group decisions and correctly predicted the exact shift in more than half the cases.

In 1966 Bateson showed that the risky shift could be produced without any group discussion. In his experimental procedure the group discussion was replaced by a procedure for individual analytic study (familiarization). He wished to test the hypothesis that familiarization, without any group discussion, will lead to an increase in riskiness. The initial encounter with the problem might not leave the individual ready to commit himself since he did not have sufficient time to weigh all the pros and cons. He would therefore be inclined towards a cautious response at that time. After careful study of the problem, however, he might commit himself to a riskier decision instead of the "I don't know" which underlies the initial caution.

Bateson used five of the twelve case problems which yield risky group shifts. Individuals in the familiarization condition were asked to first record their decision and then to assume the role of a consultant and prepare a brief of the problem which listed the pros and cons, and lastly to make a final decision. Another set of subjects filled out the questionnaire alone initially and then met in groups, discussed the problem and filled out the questionnaire again.



The results of this study (subsequently confirmed by Flanders and Thistlethwaite, 1967) showed a risky shift not only in the group discussion condition, but also in the familiarization condition. Thus, analytic reflection on a problem seems to account for some of the risky shift.

The research to be reported in this paper compares the group discussion and the familiarization process, not only on problems yielding a risky shift but on others known to yield a cautious shift. Will the "familiarization" process work on cautious problems?

### The Experiment

Forty-eight students in the MIT Sloan School of Management were treated in two groups, one for the group discussion condition and one for the familiarization condition.\* The design of the research is very small in scale, the time available being only two hours. Six questions were used of which three were designed by Stoner to produce a cautious shift (representing cultural values associated with caution) and three were designed to produce risky shifts. All six of the questions have been previously shown (Stoner, 1968) to produce the expected shifts after group discussion.

### Procedure

Booklets with instructions were given to the 45 class members, and they were asked to record their individual decisions. The answers were collected after ten minutes. Five groups of five men each were then asked to report to five separate

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\*I thank Professors David Kolb, Irwin Rubin and Suresh Srivastva for permission to use a class session, and also Professor Stoner for help in monitoring a rather complex procedure which included feedback to the class at the end of the session.

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rooms with an experimenter. There they were given the same booklets and instructed to discuss the problems and come to a unanimous decision; that is, agreement by all and not just a majority vote. The groups had no leader or chairman. They were told to spend about five minutes on each question. The experimenter did not take part in the discussion. Each person indicated in the booklet the decision of the group, and then went back and recorded his own private or personal decision, which may or may not have agreed with that of the group.

The other 20 individuals remained in the classroom and were asked to analyze each problem, listing on a separate sheet of paper the pros and cons for taking the alternative action. They were then asked to indicate their personal decision choice for each problem.

### Results

The average shift for the groups was calculated by taking the difference between the mean individual decision before and after the experimental procedure (Table I). The average of the individual decisions made after the group discussion was used instead of the group decision in order to compare it to the familiarization condition in which there was no group decision.

The only finding which is not a replication of previous research is the shift on cautious problems after the familiarization procedure. The number of individuals shifting cautious on each problem (23 cautious shifts vs. eight risky shifts out of 64) is significant ( $p$  (one-tail)  $< .01$ ).



TABLE I

Average Individual Decision Under Four Experimental Conditions

	Group Discussion			Familiarization		
	Prior	After	Direction of Shift	Prior	After	Direction of Shift
3 risky problems	4.2	2.9	risky	3.8	3.4	risky
3 cautious problems	6.8	6.9*	cautious	6.4	6.9	cautious

\* The shift is much smaller than has been obtained in other large scale studies and must be attributed to the law of small numbers.

### Conclusion

An understanding of a phenomenon which heretofore has been confused and controversial now seems to be coming into focus after seven years. In the so-called "group risky shift," "group" is not an essential element, as demonstrated by the individual familiarization procedure; "risk" is also not an essential element as demonstrated by the cautious shift in some situations. The fact of a shift of some predictable direction and magnitude remains to be explained.

The findings reported in the paper, considered together with previous results, point to the following conclusions:

1. The direction of shift is determined by the average initial position relative to the mid point, which in turn is determined by relative values of stake and prize.
2. The magnitude of the shift is determined by the size of the discrepancy between the average initial position and the neutral mid point.



3. When the shift is the result of group discussion, its magnitude is also a function of the variance of the members' initial positions.

The process of executive decision making, which involves analytic reflection and group consultation, is thus not subject to any binding forces in either the risky or the cautious direction. The decision process moves from a less decisive position to a more decisive one on the same side of the neutral point.



# REFERENCES

- Bateson, N. Familiarization, group discussion and risk taking, J. exp. soc. Psychol., vol. II (1966), 119-129.
- Brown, R. Social Psychology, New York: The Free Press, 1965.
- Burns, J.F. An Extremity-Variance Analysis of Group Decisions Involving Risk. Unpublished Ph.D. thesis, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, Mass., 1967.
- Flanders, J.P. and D.L. Thistlethwaite. Effects of familiarization and group discussion upon risk taking, J. Personality and soc. Psychol., vol. V (1967), 91-97.
- Kogan, N., M.A. Wallach, G. Mandler and P. Mussen. New Directions in Psychology III, New York: Holt, Rinehart and Winston, Inc., 1967.
- Marquis, D.G. Individual responsibility and group decisions involving risk, Industr. Mgmt. Rev., vol. III (1962), 8-23.
- \* Nordhøy, F. Group Interaction in Decision Making Under Risk. Unpublished Master's thesis, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, Mass., 1962.
- \* Stoner, J.A.F. A Comparison of Individual and Group Decisions Involving Risk. Unpublished Master's thesis, Sloan School of Management, Massachusetts Institute of Technology, Cambridge, Mass., 1961.
- \* Stoner, J.A.F. Risky and cautious shifts in group decisions: The influence of widely held values, J. exp. soc. Psychol., 1968 (in press).
- Teger, A.I. and D.G. Pruitt, Components of group risk taking, J. exp. soc. Psychol., vol. III (1967), 189-205.
- Wallach, M.A., N. Kogan and R.B. Burt. Are risk takers more persuasive than conservatives in group discussions?, J. exp. soc. Psychol., vol. IV (1968), 76-88.
- Zajonc, R.B., R.J. Wolosin, Myrna Wolosin and S.J. Sherman. Individual and group risk-taking in a two-choice situation, J. exp. soc. Psychol., vol. IV (1968), 89-106.









